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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/768,182	02/02/2004	Hiroshi Nagasawa	NAGASAWA10	3666
1444	7590	12/13/2005	EXAMINER	
BROWDY AND NEIMARK, P.L.L.C. 624 NINTH STREET, NW SUITE 300 WASHINGTON, DC 20001-5303			BRUENJES, CHRISTOPHER P	
			ART UNIT	PAPER NUMBER
			1772	

DATE MAILED: 12/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/768,182

Applicant(s)

NAGASAWA, HIROSHI

Examiner

Christopher P. Bruenjes

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) 8 and 9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 10-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-12 are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 June 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 20051125.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Election/Restrictions***

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-7 and 10-12, drawn to ionic conductor, classified in class 428, subclass 34.4.
- II. Claims 8-9, drawn to a method of making an ionic conductor, classified in class 427, subclass 407.2.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product as claimed can be made by another and materially different process such as attaching the ionizable functional groups to the porous body utilizing an intermediate binder or adhesive layer and bonding the hydrophobic groups to separate portions of the surfaces of the continuous pores from the ionizable functional groups. Thus, the ionizable functional

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groups would not be attached by covalent or hydrogen bonding to active groups present on the surface of the pores or to the hydrophobic groups. However, the article produced by this method would still read on the structural limitations of claims 1 and 10-12.

2. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

3. During a telephone conversation with Sheridan Neimark on October 18, 2005 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-7 and 10-12. Affirmation of this election must be made by applicant in replying to this Office action. Claims 8-9 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

#### ***Claim Objections***

4. Claims 2-3 are objected to because of the following informalities: "Ceramics" in claims 2 and 3 cause a grammatical

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error and should be replaced with "ceramic". Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The limitations "plate-like" and "pipe-like" shapes render the claim vague and indefinite because it is not understood what in addition to a plate or pipe is considered plate-like or pipe-like.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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6. Claims 1-4, 7, and 10-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Bardhan et al (US 2002/0142339 A1).

Regarding claims 1 and 10-12, Bardhan et al anticipate a planar, rigid substrate comprising a porous inorganic body which as a plurality of continuous pores passing through said porous body and cationic polymer molecules attached to surfaces of said continuous pores (see abstract and Figure 1). The cationic polymer molecules are ionizable functional groups (p.2 paragraph 16). Note the preamble in claims 1 and 10-12 is given little patentable weight because the structure of the article is fully defined in the body of the claim and the preamble merely provides an intended use for the structure, which does not result in a structural difference between the claimed invention and the prior art. In this case, the structure taught by Bardhan et al being formed of a porous body having ionizable functional groups attached to the pores passing through the porous body would be capable of functioning as an ionic conductor, and therefore could be placed in an ionic conductive diaphragm, ionics element, and/or ionics instrument. Regarding claims 2-3, the porous body comprises a porous ceramic such as porous glass (p.2, paragraph 13). Regarding claim 4, the

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average diameter of said continuous pores is in the range of 4 to 20 nm (p.2, paragraph 14), and the porosity of the article is inherently within the range of 5 to 90% as shown by the Figure 1. Regarding claim 7, the article of Bardhan et al is a planar, rigid substrate, which is a plate-like shape.

7. Claims 1-3 and 10-12 are rejected under 35 U.S.C. 102(b) as being anticipated by JP'559 (JP 58-027559 A).

Regarding claims 1 and 10-12, JP'559 anticipate an article comprising a porous body which has a plurality of continuous pores passing through said pore body since it acts as an absorbent and sulphonic acid radicals attached to surfaces of said continuous pores (see abstract). The sulphonic acid radicals are inherently ionizable functional groups since the instant specification states that the ionizable functional groups used in the instant invention are sulphonic acid radicals. Note the preamble in claims 1 and 10-12 is given little patentable weight because the structure of the article is fully defined in the body of the claim and the preamble merely provides an intended use for the structure, which does not result in a structural difference between the claimed invention and the prior art. In this case, the structure taught by JP'559 being formed of a porous body having ionizable functional groups

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attached to the pores passing through the porous body would be capable of functioning as an ionic conductor, and therefore could be placed in an ionic conductive diaphragm, ionics element, and/or ionics instrument. Regarding claims 2-3, the porous body comprises a porous ceramic such as porous glass, alumina, or silica-alumina (see abstract).

8. Claims 1-5 and 10-12 are rejected under 35 U.S.C. 102(b) as being anticipated by JP'819 (USPN 58-026819 A).

Regarding claims 1 and 10-12, JP'819 anticipate an article comprising a porous body which has a plurality of continuous pores passing through said pore body since it acts as an absorbent and sulphonic acid radicals attached to surfaces of said continuous pores (see abstract). The sulphonic acid radicals are inherently ionizable functional groups since the instant specification states that the ionizable functional groups used in the instant invention are sulphonic acid radicals. Note the preamble in claims 1 and 10-12 is given little patentable weight because the structure of the article is fully defined in the body of the claim and the preamble merely provides an intended use for the structure, which does not result in a structural difference between the claimed invention and the prior art. In this case, the structure taught by JP'559



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being formed of a porous body having ionizable functional groups attached to the pores passing through the porous body would be capable of functioning as an ionic conductor, and therefore could be placed in an ionic conductive diaphragm, ionics element, and/or ionics instrument. Regarding claims 2-3, the porous body comprises a porous ceramic such as porous glass (see abstract). Regarding claim 4, the average diameter of said continuous pores is in the range of 70 to 200 nm, and the porosity of the article is inherently within the range of 5 to 90% since the pore volume of the article is between 0.3 and 2.0cc/g (see abstract). Regarding claim 5, hydrophobic groups are attached to the surface of said continuous pores, since the surface of the glass, which contains the continuous pores, is coated with a hydrophobic polymer substance (see abstract).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

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The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP'819 (JP 58-026819 A) in view of Clough (US 2001/0016288 A1).

JP'819 teaches all that is claimed in claim 5, but fails to explicitly teach that the hydrophobic groups attached to the surface of said continuous pores are alkyl groups or fluorocarbon functional groups. However, Clough teach that hydrophobic alkyl groups are used as hydrophobic groups attached to porous ceramics containing sulphonic acid groups in order to render the porous material hydrophobic (p.9, paragraph 62). One of ordinary skill in the art would have recognized that JP'819 and Clough are analogous insofar as both references are

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concerned with attaching hydrophobic groups to a porous ceramic material containing sulphonic acid groups.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the applicant's invention was made to use the hydrophobic alkyls taught in Clough as the hydrophobic groups attached to the surfaces of the continuous pores of JP'819 in order to render the porous ceramic material of JP'819 hydrophobic, as taught by Clough.

#### **Conclusion**

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Himeshima et al (USPN 6,039,892); Kobayashi et al (USPN 5,482,609); Neti et al (USPN 3,787,309).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher P. Bruenjes whose telephone number is 571-272-1489. The examiner can normally be reached on Monday thru Friday from 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon can be reached on 571-272-1498. The fax phone number for the

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organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Christopher P Bruenjes

Examiner

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CPB

CPB

December 8, 2005

  
ALICIA CHEVALIER  
PRIMARY EXAMINER